

Remarks

Claims 1-39 are pending and canceled, and new claims 40-46 have been added. Claims 1-8 and 10-39 were canceled, without prejudice, as being drawn to a non-elected invention. Elected claim 9 has been canceled and rewritten as claims 40 and 41. Reexamination and reconsideration of the claims as amended is requested. A marked-up version of the amended claims is attached.

Support for claims 40 and 41 is found at least at page 5, lines 19-21, and in original claims 1 and 9. Support for new claims 42 and 43 is found at least at page 27, lines 7-9, and page 31, lines 6-17. Support for new claim 44 is found at least in Example 2, pages 28-35. Support for new claim 45 is found at least at page 9, lines 18-19, and in Example 10, pages 56-57. Support for new claim 46 is found at least at page 31, lines 6-17.

I. Claim Objections

Claim 9 was objected to as depending from a non-elected invention. The objection is now moot with respect to the claims as amended.

II. Rejections under 35 U.S.C. § 112

Claim 9 was rejected under 35 U.S.C. § 112, first paragraph, as being inadequately described by the specification. Claim 9 also was rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Applicants respectfully traverse the rejections if applied to the claims as amended.

2nd Paragraph Rejection

Claim 9 was alleged to be indefinite for the lack of antecedent basis of the term "herbicidal inhibitor" in claim 1. The rejection is now moot if applied to the claims as amended.

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AMENDMENT AND
RESPONSE TO OFFICE ACTION

1st Paragraph Rejection

The Patent Office has the burden of establishing that a description as filed is inadequately described. In the present case, a proper *prima facie* case of lack of written description has not been made, as the required evidence or reasoning supporting the rejection is incorrect and/or insufficient in view of the substantial description and detail provided in applicants' specification.

The Office Action alleges that the specification does not disclose "any particular structure to function/activity relationship in the disclosed indole-3-propanol phosphate inhibitor for which predictability of structure of any other tryptophan synthase inhibitor can be determined."

Applicants do not allege that indole-3-propanol *phosphate* inhibitors would predict TS inhibitors *that are effective as herbicides*. The Examiner's statement is thus irrelevant to whether the specification adequately describes the subject matter of the present claims. The Office Action also alleges that the specification does not describe "additional representative species of these tryptophan synthase inhibitors by any identifying structural characteristics or properties other than being identified using said in vitro assay." This allegation is inaccurate and an improper application of current patent law and procedures as detailed below.

Applicants' specification "conveys with reasonably clarity to those skilled in the art" that applicants were in possession of the claimed invention. See, e.g., Vas-Cath, Inc., v. Mahurkar, 935 F.2d 1555 (Fed. Cir. 1991). All that is required is that the claimed compound be defined by "whatever characteristics sufficiently distinguish it." Amgen, Inc. v. Chugai Pharmaceutical, 927 F.2d 1200 (Fed. Cir. 1991). In the present case, applicants clearly describe methods to identify the herbicidal TS inhibitors and distinguish them from other compounds that are neither herbicidal nor TS inhibitors. For example, the specification describes several species of

herbicidal TS inhibitors in Examples 1 and 2 (e.g., phosphonate isoesters of IPP and arylalkyl phosphonate sulfides). The specification also describes other species of the compound by chemical structure and function. For example, applicants describe that the compound can bind to the active site of the α subunit by mimicking the structure of the natural TS α substrate of IGP and the specification gives a list of possible specific structural modifications of the herbicidal inhibitor as compared to the natural substrate (page 8, lines 11-28). Other structures (arylthioalkyl- and arylthioalkenylphosphosphonic acids and derivatives thereof) are described by formula I shown at pages 6-8, along with description useful for selecting and predicting modifications that would be likely to yield an herbicidal TS inhibitor (pages 9-14). The specification also describes in detail a variety of methods for identifying the compounds including *structure*-based approaches based on the *known structure* of the TS enzyme (page 17, lines 4-7).

Moreover, M.P.E.P. § 2163(II)(A)(3)(a) states

An applicant may also show that an invention is complete by disclosure of sufficiently detailed, relevant identifying characteristics which provide evidence that applicant was in possession of the claimed invention, i.e. complete or partial structure, *other physical and/or chemical properties*, functional characteristics when coupled with a known or disclosed correlation between function and structure, or some combination of such characteristics....

For some biomolecules, examples of identifying characteristics include...binding affinity, binding specificity.... **Although structural formulas provide a convenient method of demonstrating possession of specific**

molecules, other identifying characteristics or combinations of characteristics may demonstrate the requisite possession. For example, unique cleavage by particular enzymes,...**a comparison of enzymatic activities**,...may be sufficient to show possession of the claimed invention.

(emphasis added).

In the present case, the specification clearly describes, for example, a comparison of enzymatic activities for use in identifying the TS inhibitor and showing possession. For all of these reason, applicants have clearly demonstrated possession of the claimed invention in accordance with current standards. Therefore, no proper *prima facie* case of lack of written description has been established.

III. Rejection under 35 U.S.C. § 102

Claim 9 was rejected under 35 U.S.C. § 102(b) as anticipated by Wolf, et al., "Tryptophan synthase from yeast. Purification by affinity chromatography, physical properties," *Eur. J. Biochem.* 45(1):269-76 (1974) (hereinafter "Wolf"). Applicants respectfully traverse the rejections if applied to the claims as amended.

Wolf discloses that several small molecules will inhibit tryptophan synthase. However, Wolf does not disclose TS inhibitors that are *effective as a herbicide*. There is no disclosure or suggestion in Wolf of herbicidal activity as required by the present claims. Accordingly, Wolf does not disclose all the limitations of the present claims. The claims are thus novel over Wolf.


IV. Conclusion

The claims as amended are thus novel over the prior art of record. Allowance of claims 40-46 is therefore earnestly solicited.

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If there are any issues that can be resolved by a telephone conference or an Examiner's amendment, the Examiner is invited to call the undersigned attorney at (404) 853-8081.

Respectfully submitted,



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Version with Markings to Show Changes Made To the Claims

1-39. (Canceled).

40. (New) A composition comprising a compound which binds to tryptophan synthase and inhibits tryptophan synthesis and which is effective as a herbicide.

41. (New) The composition of claim 40, wherein the compound is identified by a method comprising the steps:

adding a test compound to an *in vitro* assay comprising tryptophan synthase or at least one subunit thereof, said *in vitro* assay being adapted for detecting the activity of said tryptophan synthase or subunit thereof; and

determining whether tryptophan synthase is inhibited by said test compound.

42. (New) The composition of claim 41, wherein the method further comprises determining whether said test compound which has been determined to inhibit tryptophan synthase is effective as a herbicide.

43. (New) The composition of claim 42, wherein determining whether said test compound is effective as a herbicide comprises adding the test compound to an *in vivo* assay for detecting herbicidal activity.

44. (New) The composition of claim 40, wherein the compound is an aryl sulfide phosphonate.

45. (New) The composition of claim 40, wherein the composition comprises an ester or salt form of the compound.

46. (New) The composition of claim 40, wherein the compound is dispersed in an aqueous carrier.